AMENDMENTS TO THE CLAIMS:

1. (Previously Amended) A method for producing a semiconductor device including formation of an interlayer insulating film having a fluorine-doped silicon oxide layer above a substrate, the method comprising the steps of:

forming said fluorine-doped silicon oxide layer in a process chamber; and

forming a silicon oxide layer on said fluorine-doped silicon oxide layer in a same process chamber subsequent to formation of said fluorine-doped silicon oxide layer, said silicon oxide layer being formed at a temperature at least 10% higher than a film forming temperature of said fluorine-doped silicon oxide layer; thereby

forming said interlayer insulating film comprising said fluorine-doped silicon oxide layer and said silicon oxide layer formed thereon.

2. (Original) The method for producing a semiconductor device according to claim 1, wherein

a film forming temperature of said silicon oxide layer is equal or less than 450 °C.

3. (Previously Amended) The method for producing a semiconductor device according to claim 1, further comprising:

forming an insulation layer on said silicon oxide layer; and

planarizing said insulation layer with a chemical mechanical polishing process or a plasma etching process from a surface side of said insulation layer without exposing said fluorine-doped silicon oxide layer.

4. (Previously Amended) A method for producing a semiconductor device including formation of an interlayer insulating film having a fluorine-doped silicon oxide layer ~~on~~ over a substrate, the method comprising:

forming said fluorine-doped silicon oxide layer in a process chamber; and

removing a surface layer of said fluorine-doped silicon oxide layer by sputtering in the same process chamber subsequent to the formation of said fluorine-doped silicon oxide layer and prior to formation of an insulating layer over the fluorine doped silicon oxide layer.

5. (Previously Amended) The method for producing a semiconductor device according to claim 4, further comprising:

forming an insulation layer over a surface layer of said fluorine-doped silicon oxide layer after the sputtering; and

planarizing said insulation layer with a chemical mechanical polishing process or a plasma etching process from a surface side of said insulation layer without exposing said fluorine-doped silicon oxide layer.

Please add the following new claims:

6. (Newly Added) The method of producing a semiconductor device of claim 1, wherein the step of forming the silicon oxide layer is performed prior to any additional step of further processing the fluorine doped silicon oxide layer.

7. (Newly Added) The method of producing a semiconductor device of claim 4, wherein the step of removing the surface layer is performed prior to any additional step of further processing the fluorine doped silicon oxide layer.

8. (Newly Added) The method of producing a semiconductor device of claim 4, wherein the step of removing the surface layer is performed by sputtering such that the temperature during sputtering reaches a value higher than a temperature of forming the fluorine-doped silicon oxide layer.